

A NEW SPECIES OF FOSSIL ISOPTERA (KALOTERMITIDAE)
FROM THE RUBY RIVER BASIN (OLIGOCENE)
OF SOUTHWESTERN MONTANA¹

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Abstract.—This is the first fossil isopteran of the family Kalotermitidae to be found from the Oligocene sediments of the Ruby River Basin of Montana. The specimen is provisionally placed in the genus *Prokalotermes* with the new specific name *alderensis*.

One specimen of an imago termite fossil (Isoptera: Kalotermitidae) was discovered from the paper shale deposits of the Ruby River Basin of SW Montana. This specimen, which is provisionally placed in the genus *Prokalotermes* Emerson, represents the first member of the genus and family to be described from the Ruby River Basin. Another species of *Prokalotermes*, *P. hageni* (Schudder), was described from the Oligocene shales of Florissant, Colorado (Emerson, 1969). Lewis (1973) reported a fossil termite of the family Hodotermitidae from the same locality.

The specimen was found in layered shales of Oligocene age between Peterson and Mormon Creeks, sec. 23 T.7S., R.5W., Madison County, Montana. The digging sites are located about 13 mi from the town of Alder. A brief description of the geological history of this region can be found in a previous taxonomic work from this area (Lewis, 1971).

This fossil impression is represented by portions of the body, parts of the forewings, and a small portion of the legs. The two impressions present are reverse images of the same individual. The shale rock seems to be a volcanic ash deposit with a similar appearance to the Florissant Shales of Colorado. There is no doubt that this specimen belongs to the family Kalotermitidae of the order Isoptera. The Tertiary fossil species of this family has been recently revised by Emerson (1969).

Prokalotermes (?) *alderensis* Lewis, new species
(Fig. 1)

Imago.—Color of head, pronotum, wings scales, and tergites dark brown but possibly modified by preservation. Total length of body 12.4 mm. Head with rather rounded sides. Y-suture not distinct. Eyes moderate in size and slightly prominent at sides. Visible length of eye (about 0.69 mm) medium in size and similar in proportion to most genera of the family. Presence and position of ocelli not clear. Antenna present with 16-17 articles visible. Dentition of left mandible not clear, but resembling that of *Prokalotermes hageni* (Emerson, 1969, Fig 3A). Proportion of size of

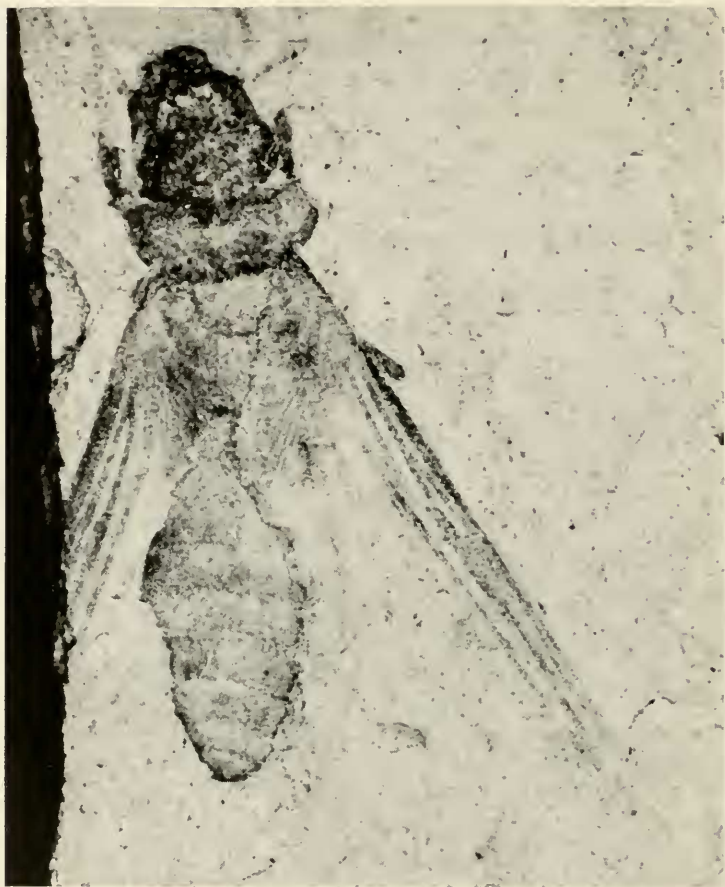


Fig. 1. Photograph of *Prokaloterme*(?) *alderensis* from the Ruby River Basin (Oligocene) of S.W. Montana (8.3 \times).

apical and marginal teeth in left mandible not sufficiently distinct to compare accurately with *P. hageni* (Emerson, 1969, Figs. 3A and 5A). Width and length of head at broadest points 2.4 mm. Pronotum wider than head, with distinct median longitudinal line; front margin slightly concave; side margins with convex arch; front angles sharply rounded; hind angles very gradual; hind margin with slight center notch. Pronotum 3.2 mm in length and 1.4 mm in width at longest and widest points. One front tibia visible with possibly 3 proportionally long spurs. End of tarsus, claws and arolium not visible. Tarsus with what appears to be 4 articles. Costal margin of forewing scale almost flat. Humeral suture of forewing flatly curved. No short Sc visible in forewing beyond humeral suture. R_1 , R_2 ,

R₃ and R_s possibly visible at suture. M not clear, with its position in middle of wing not certain. Confusion of venation may be due to overlap of forewing and hindwing in several places. Length of wing present 10.7 mm. Abdomen incomplete, but clear. Total width and length not determinable. Eight tergites visible, but styli or cerci not seen.

Holotype.—No. B-3. Described from an incomplete adult termite. Found near Alder, Montana, by Herman F. Becker, 196(?). Upper Oligocene sediment of the Ruby River Basin, reverse present. Specimen presently maintained by S. E. Lewis at St. Cloud State University. When work on entire fossil collection is completed, this specimen will be deposited in the American Museum of Natural History, New York.

Comments

On the basis of the costal margin of the forewing scale, the humeral suture, the dentition of the left mandible and shape of the pronotum, this specimen most clearly resembles the Florissant species *Prokalotermes hageni*. The flat curve of the costal margin of the forewing scale clearly is similar to that of *P. hageni* and is distinctly flatter than the costal margin of the forewing scale of *Proelectrotermes berendtii* (Pictet) or *Proelectrotermes fodinae* (Scudder) also from the Florissant shales (Emerson, 1969, Figs. 3, 4, and 5).

The length of the costal margin of the forewing scale is about 1.83 mm, considerably longer than *Prokalotermes hageni*, with scale length of 1.10 mm, and *Proelectrotermes fodinae*, at 1.10–1.22 mm. The humeral suture is flatly curved as in *Prokalotermes* and *Proelectrotermes* and not as much arched as in *Electrotermes* von Rosen and most other genera of the Kalotermitidae with the exception of *Postelectrotermes* Krishna, which has a slightly more arched suture (Krishna, 1961).

As previously mentioned, the proportion of the size of the apical and marginal teeth in the left mandible are not sufficiently distinct to compare accurately with Emerson's studies (1969). It seems that the apical tooth is similar to that of *P. hageni*, whereas the marginal teeth and the angle between them are similar to *P. fodinae*, thus giving one a more transitional specimen.

The pronotum with its distinct median longitudinal line, slightly concave front margin, convexly arched side margins, sharply rounded front angles and gradual hind angles are all similar to *Prokalotermes hageni*. Although the size does resemble that of *Proelectrotermes berendtii*, the overall comparison favors that of *P. hageni*.

In comparing the fossil kalotermitids from the Oligocene of North America, one is certainly justified in stating that the Ruby River specimen is larger than those of Florissant. This difference is sufficient for a species

difference, and the wider pronotum in relation to head may indicate a generic difference, but size differences, especially those of shale specimens with some distortion and inaccuracies, should not be used for generic distinction without many other characteristics associated with them.

Based on the information that is obtainable from this specimen, it is felt that this is a new species possibly belonging to *Prokalotermes* but also possibly a new genus of primitive Kalotermitidae (personal communication, Emerson, 1975). I do not believe a new genus should be described for this specimen at this time. The new species is now placed provisionally in the genus *Prokalotermes* with the specific name of *alderensis* until more material is gathered and studied.

Acknowledgment

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